Distributed Resources Demonstration

Contract #: 500-97-011 **Project #:** 4
Contractor: San Diego Gas and Electric Company
Project Amount: $450,000
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Status: Completed

Project Description:
The purpose of this project was to demonstrate technology that would reduce the cost of parallel interconnection to electric distribution grids from distributed generation systems while still maintaining mandated safety and system protection features.
Technologies under consideration included solid-state interconnection devices and advanced generation systems such as new dual-fuel (90 percent natural gas, 10 percent diesel) reciprocating engines, advanced gas turbines, and microturbines.

Objectives:

- Demonstrate a solid-state interconnection device with remote dispatching and control capabilities.
- Demonstrate an advanced dual-fuel generator (90 percent natural gas and 10 percent diesel).
- Demonstrate other advanced generation systems.

This project supports the PIER Program objective of:

- Improving the reliability/quality of California's electricity by improving the integrity, reliability and safety of California's energy supply system through diverse distributed electrical resources. In addition, this project addresses electrical distribution issues raised by deregulation of the California electricity industry.

Proposed Outcomes:

1. Solid-state interconnection device connected to an electric utility distribution grid was successfully implemented and demonstrated.
2. Dual-fuel systems can not obtain permits because of emission constraints.
3. Other advance generation technology was not available in time to meet project schedule.

Actual Outcomes:

1. Solid-state interconnection device can safely interconnect in parallel to electric grid.
2. Solid-state interconnection device is relatively the same size and has the same ease of operation with a wide range of generator sizes.
3. Solid-state technology shows promise for reducing cost of interconnection.
4. The dual-fuel generator originally proposed would not be cost effective as a distribution-generation option because of emission control costs in California.
5. Other advanced generation technologies (such as microturbines and advanced gas turbines) showed promised but were not ready in time to meet the schedule for this demonstration.

Recommendations

1. Demonstrate the solid-state interconnection device with automatic transfer switch and test under live power outage condition.
2. Look at alternative suppliers of solid-state interconnection devices to provide competition to reduce cost and improve quality of product and services.
3. Demonstrate the incorporation of advance generation systems with the solid-state device when such systems become available.

Project Status:

The project has been completed. The final report is posted on the PIER website and is titled Demonstration and Evaluation of Solid-State Interconnection System (Publication # 600-00-035). For the final report, please right click on www.energy.ca.gov/pier/final_project_reports/600-00-035.html